



Oregon

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January 22, 2010

Mr. Chris Cora
US Environmental Protection Agency
Region 10
1200 6th Avenue, Suite 900, ECL-115
Seattle WA 98101-3140

RE: DEQ Comments on Voluntary Group Response to
EPA Comments on HHRA/ERA, Harbor Oil Superfund
Site, Portland, DEQ File ECSI #24

Dear Mr. Cora:

The Department of Environmental Quality has reviewed the responses from the Harbor Oil Superfund Site Voluntary Group, dated Dec. 22, 2009. The VG responses were to US Environmental Protection Agency Region 10 comments dated Nov. 27, 2009, on the draft Human Health Risk Assessment and Ecological Risk Assessment. The following are DEQ comments that correspond to specific VG responses identified by the comment numbers.

1. General Review of the Human Health Risk Assessment and Ecological Risk Assessment.

Many of the comments and questions regarding the HHRA and ERA result from reviewing these documents prior to receipt of the Remedial Investigation Report. Typically, the RI summarizing investigation results and the geologic model is available before the risk assessments and is a foundation for developing the risk assessment and an aid to the reviewer. Evaluation and discussion of several important topics that would be in the RI are not available now including: complete conceptual site model, stormwater, North Lake data, and groundwater to surface water pathway.

- 2. Use of 2000 Sampling Data in HHRA/ERA (Voluntary Group response HHRA #2, Specific #5a, ERA response #1).** DEQ evaluated adequacy of the data and EPCs, utilizing the database provided by the VG to the Environmental Protection Agency. With regard to use of 2000 data, DEQ has concluded that the 2000 data could be used in the risk assessments along with the 2008/2009 data. However, with respect to PCB and DDT analyses, DEQ is concerned about the possibility of misidentification of these compounds in solid matrices (soil and sediment) and would like to request that the VG review this issue with the analytical laboratory. Data from both time periods are generally comparable with respect to analytes. All 2000 data were validated and none were rejected. All analyte groups in the 2000 and 2008/2009 data sets were identical except for no organic carbon data in 2000. With respect to exposure point concentrations calculated by the VG, DEQ concludes that based on available data the EPCs are acceptable. With respect to completeness of site characterization, DEQ concludes that site characterization is adequate except for (1) sediment; and, (2) the vapor intrusion pathway.

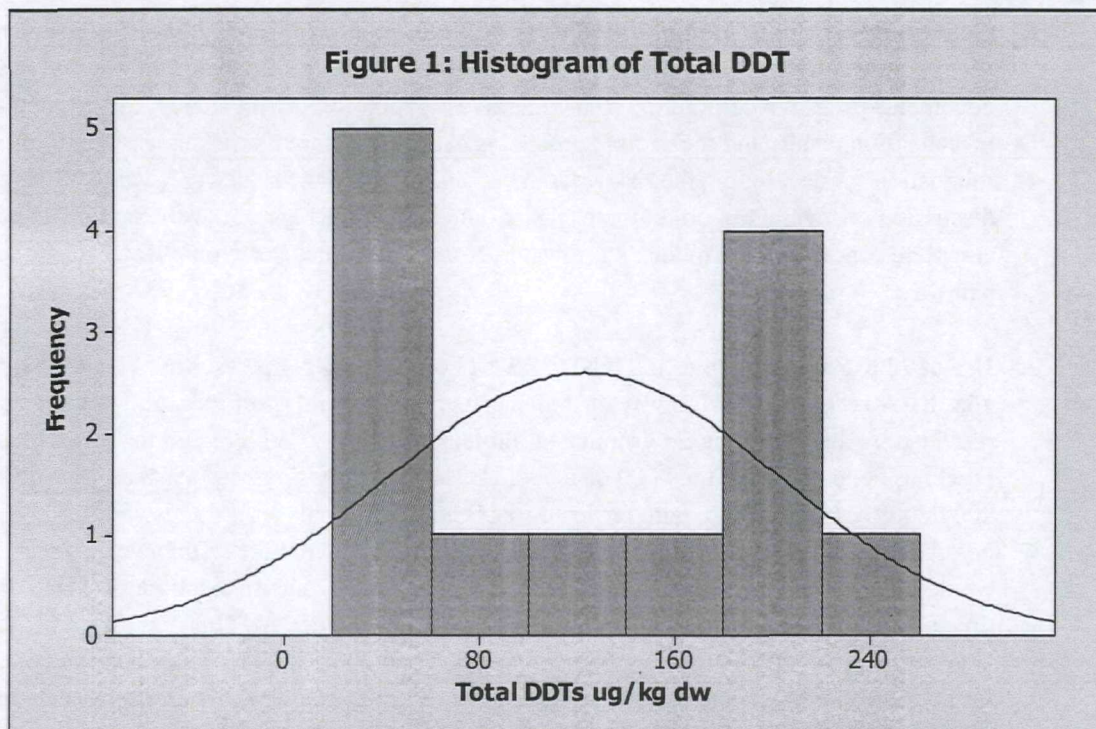
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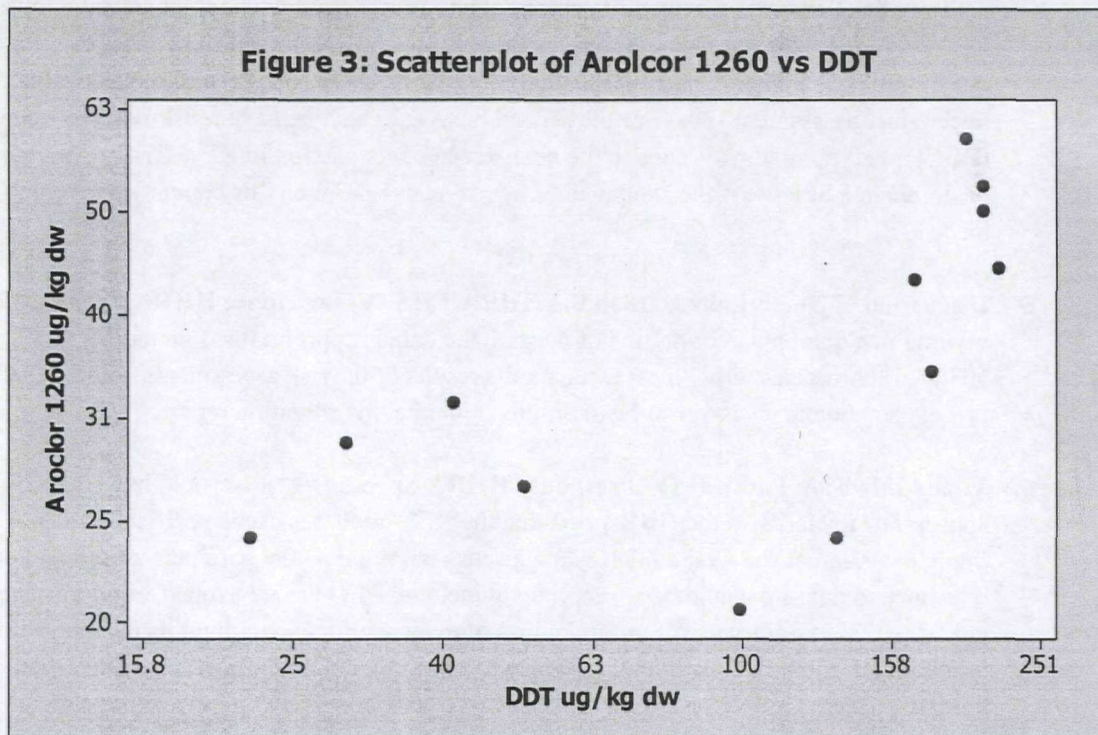
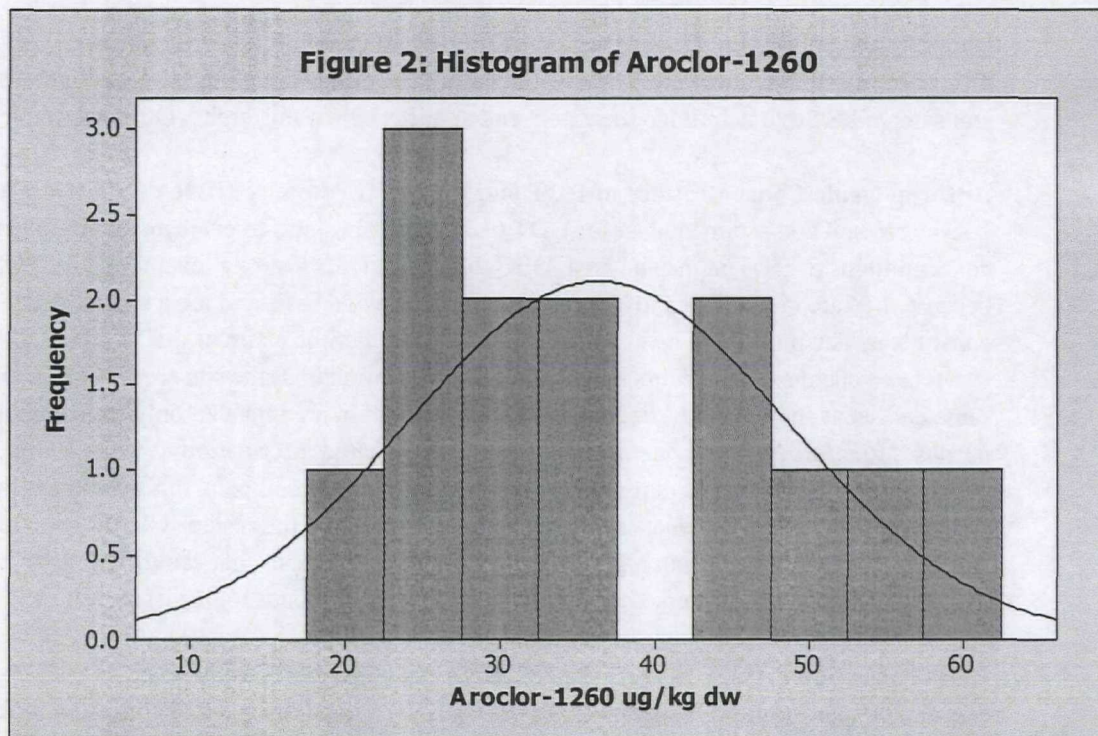


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Sediment Characterization. Evaluation of both the spatial and statistical distribution of sediment data, particularly for chemical groups DDT and PCBs, indicates that lower concentrations of both are detected generally around the perimeter of Force Lake with higher concentrations in the center and distal end of the lake (See Maps 10 and 11 in site characterization report). The statistical distributions of total DDT and Aroclor 1260 do not indicate a single population but appears to be bimodal, with higher and lower but few intermediate concentrations (see Figures 1 and 2). Figure 3 shows the relationship between Aroclor 1260 and DDT after log-transformation. This figure corresponds to a significant Pearson's R correlation coefficient of 0.65, $P = 0.02$. The correlation is indicative of either or both of two possibilities. First, the correlation suggests a common source for PCBs and DDT compounds in Force Lake sediment. Secondly, as shown in Table 4-2 of the site characterization report, both PCBs and pesticides were analyzed by Gas Chromatography with an electron capture detector. Due to their structural similarity, PCBs and DDT compounds co-elute on chromatographic columns and are not easily differentiated by ECD. Therefore, it is likely that there is some misidentification of the PCBs and DDT compounds in Force Lake sediment, resulting in the correlation shown in Figure 3. This misidentification can be resolved using high-resolution methods with a mass spectrometer and appropriate matrix cleanup steps. DEQ's opinion is that sediment is not adequately characterized, particularly for PCB and DDT compounds.





Vapor Intrusion Pathway Characterization. DEQ's evaluation of the vapor intrusion pathway, discussed in detail in comment 6 below, indicates that further sampling is needed in the area of soil sample LS-10 to determine the extent and significance of this high VOC detection in soil.

3. **Anthropogenic Concentrations of DDT and PCB (VG response HHRA #3, ERA #3).** DEQ considered soil and sediment data for DDT from nearby projects to evaluate anthropogenic concentrations of DDT in the site area. DEQ did not conduct a similar evaluation for PCBs because they are not believed to be present on an area-wide basis and are a site-related constituent. The purpose of this evaluation was to consider the claim of the VG that DDT is not a site-related chemical and occurs in soil and sediment throughout the site area by evaluating the same dataset as the VG. The conclusions of this evaluation are intended only for contextual purposes to inform risk management decisions. DEQ shared information with the VG group to avoid duplication of effort or cross purposes. DEQ expects to complete this evaluation by the end of January 2010 and will issue a separate memo summarizing the results. Clarification of DDT and PCB concentrations using high-resolution analytical methods that can differentiate between these two compounds, discussed in comment 2 above, also relates to this issue.
4. **COPC Selection Process (VG response HHRA #5, #15, Specific #36).** The revised flow diagram on page 8 of the VG response to EPA's HHRA comments is still confusing to follow. With "was the analyte ever detected" as the first box, there needs to be another screen in the 'no' pathway that considers whether that chemical has an RBC and whether the RLs are lower than the RBC. If the RL is lower than the RBC or there is not an RBC then the chemical can be screened out. If the RL is higher than the RBC then the 'yes' pathway should lead to the "evaluate in uncertainty assessment" box. For the second box "does analyte have a risk-based concentration (RBC)", the 'no' pathway leads to the next screen of "is maximum RL > RBC". This step should be eliminated because if the analyte does not have an RBC then this comparison would not be made.
5. **Discussion of North Lake Data in the HHRA/ERA (VG response HHRA Specific #7).** At a minimum, a qualitative discussion of North Lake data is appropriate to include in the HHRA/ERA because DEQ must evaluate the results of the risk assessments without the benefit of this explanation in an as-yet-to-be-submitted remedial investigation report.
6. **Vapor Intrusion Pathway (VG response HHRA Specific #12).** It would have been useful and appropriate to clarify in the HHRA text that the RISC model is used specifically to "run" an implementation of the J&E model. Some discussion of the model parameters used and their relevance to this site would be appropriate to include. DEQ has developed vapor intrusion guidance that describes use of multiple lines of evidence for evaluating this pathway. The VG uses the J&E model as one line of evidence to support their conclusions, and DEQ would not normally accept the J&E model as the only line of evidence. DEQ performed additional evaluation of this pathway by screening soil and groundwater data against default RBCs to assess whether soil gas sampling is warranted.

DEQ compared site soil and groundwater VOC to available DEQ RBCs for residential and occupational exposure for the vapor intrusion pathway. All soil and groundwater data were below occupational RBCs except for sample LS-10 near the center of the site where TCE was detected in shallow soil at a concentration of 2,400 ug/kg. The LS-10 data point was not used in the original VG analysis. DEQ's comparison indicates that the vapor intrusion pathway may not be significant for occupational exposure at the site except for the area of LS-10. Because soil vapor can be localized, DEQ concludes that follow up sampling for the LS-10 area would be warranted and suggests obtaining 1 or 2 soil vapor samples for VOCs in this area.

7. **TPH and TPH Fractions (VG response HHRA Specific #34).** The VG is correct that the TPH fraction toxicity values have been removed from the Oak Ridge National Laboratories web site. In 2004, EPA Region 10 requested that the Superfund Technical Support Center review toxicity values for TPH fractions. The STSC took up this review in 2005 and in November 2009 DEQ received Provisional Peer-Reviewed Toxicity values from EPA for the TPH fractions. These values can be used to assess risk associated with the TPH fractions measured in Force Lake sediment or elsewhere on the site. DEQ will provide this data to the VG.
8. **Use of Dietary Approach for Screening Thresholds for Non-Invertebrates (VG response to ERA #3, Specific #13 and #14).** There are a number of uncertainties with respect to the results of the ecological risk assessment as detailed below:
 - a. Biota-Sediment Accumulation Factors in Appendix A are lower than DEQ fish BSAFs, and many are invertebrate BSAFs that have been applied to fish, particularly for DDT and PCBs. DEQ believes that these BSAFs may underestimate bioaccumulation in fish tissue. Therefore, the results for piscivorous receptors may be underestimated.
 - b. The concentrations of PCBs and DDT compounds in Force Lake sediment are not adequately characterized (See comment 2).
 - c. Use of a dietary model for fish is not an ecological risk assessment approach used on a national level and is subject to considerable uncertainty.
 - d. EPA ecological soil screening levels have undergone extensive peer review, unlike the site specific terrestrial dietary model approach, and therefore using the soil ESSLs would reduce uncertainty.
 - e. Several pathways and feeding guilds were not evaluated; the mink, for example, which is representative of piscivorous mammals.
 - f. Given, the forgoing uncertainties with respect to sediment concentration and modeling, DEQ believes that collection of fish tissue data for PCBs would be the most effective way to address these sediment concentration and modeling uncertainties, and document bioaccumulation and risk to fish and wildlife populations (as well as risk to humans through fish consumption).

- 9. Request for Bioassays to Assess Potential Toxicity of Sediments and Reduce Uncertainty (VG response ERA #10).** The VG has used PELs and PECs for comparison to sediment concentrations. As described in Macdonald, et. al. (2000) PECs are criteria above which toxicity is frequently expected, which is why DEQ does not use these as screening level criteria. As noted in the comment response, concentrations of some substances do exceed PELs/PECs, but then also substantially exceed DEQ's Level II screening level criteria. Moreover, these numeric criteria may not adequately account for the occurrence of multiple contaminants such as PCBs and TPH in the same matrix. Finally, there is some uncertainty with respect to quantification of DDT and PCB concentrations in sediment (See comment 2). Therefore, the use of bulk sediment bioassays is warranted to assess sediment toxicity.
- 10. Groundwater to Surface Water Pathway (VG response to ERA Specific #23).** The VG response indicates in the ERA section 5.1.1.2 that shallow groundwater discharging into the lake "likely" does not represent a significant pathway for exposure for aquatic benthic invertebrates. The VG do not identify where shallow groundwater is discharging into the lake (which should be discussed in an RI document). Based upon gradient maps in the preliminary data report shallow groundwater flows towards Force Lake. The VG did not screen contaminants detected in shallow groundwater using freshwater aquatic criteria. DDT is present in shallow groundwater at concentrations that exceed the chronic criteria. The primary supporting evidence presented in the risk assessment that the groundwater to surface water pathway is not significant is that higher concentrations in the lake exist essentially opposite from the site. DEQ's evaluation of sediment data indicates that this interpretation is ambiguous and highest concentrations of PCBs and DDT may be in the central portion of the lake and that some detections of these two compounds may be misinterpreted as described in comment 2.

Clarify what "na" means in Table 5-5 with regard to chemical detection in surface water and sediment; was the analyte not detected or not analyzed? Why include analytes in the table that have no data for sediment or groundwater? In the second to last paragraph on page 172, two constituents were detected in surface water (barium and copper).

Please contact me at 503-667-8414 x55008 if you would like to discuss these comments.

Sincerely,

Mavis D. Kent
Project Manager, NWR Cleanup & Emergency Response

pc: Paul Seidel, Bruce Gilles, DEQ